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Development of a Wartime Stressor Scale for Women

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Prior research has demonstrated the importance of stressor measurement as a component of evaluating posttraumatic stress disorder. Much of the work conducted in this area has focused on male combat veterans, resulting in the development of several combat exposure scales. The nature of war-zone exposure for women, however, has not been systematically addressed. This article describes the development and preliminary psychometric analyses of the Women's Wartime Stressor Scale (WWSS), an instrument designed to measure the self-report of wartime stressors by both theater and era veterans as well as civilian women who served in Vietnam. Measurement of internal consistency, test–retest reliability, and construct validity points to the potential clinical and research utility of this type of instrument.

There has been considerable discussion of the measurement of stress following wartime exposure (Watson, Juba, & Anderson, 1989). Because men compose the largest segment of U.S. military personnel, the vast majority of literature in this area has focused on the experiences of male combatants, emphasizing stressors associated with infantry duty and concurrent threat to life. To date, little is known about the wartime exposure of deployed women. One possibility is that women's exposure during wartime is similar to that of men. However, women may encounter different war stressors or may experience stressor events differently. Because there are few data on the nature of their wartime exposure, investigation of female veterans' experiences offers the opportunity to examine whether their stressor exposure resembles that of male cohorts or whether existing conceptualizations of wartime stress should be broadened or refined. Furthermore, systematic examination and measurement of women's military exposure would potentially elucidate any distinctive experiences of this understudied population.

To date, the wartime experiences of the 7,000 female veterans who served in Vietnam have received very limited clinical and research attention. Although descriptive and anecdotal information exists (e.g., Kirk, 1965; Martin, 1967; McVicker, 1985; Paul, 1985; Van Devanter, 1983), only a few empirical studies from this era have addressed quantitative and qualitative components of women's service or stressor exposure during wartime (Baker, Menard, & Johns, 1989; Dienstfrey, 1988; Schnaier, 1986; for a review, see Furey, 1991). At this time, no study has comprehensively measured the distinctive experiences of women in the war zone. The National Vietnam Veterans Readjustment Study (NVVRS; Kulka et al., 1988, 1990) is the most cited investigation of female veterans' war-zone exposure and subsequent adjustment. As part of a national sample, female veterans were administered an extensive war stressor index. Although this measure included several items examining danger posed by enemy fire, exposure to wounded and dead, personal deprivations, and so forth, the scale's derivation relied heavily on the experiences of combatants. The NVVRS results confirmed that female veterans, like their male counterparts, continue to suffer substantially elevated rates of posttraumatic stress disorder (PTSD). Furthermore, veterans with high levels of war-zone exposure—regardless of gender—were at significantly greater risk for developing this disorder than were those with low or moderate exposure.

Although the link between wartime exposure and PTSD symptomatology has now been firmly established (Card, 1987; Foy, Sipprelle, Rueger, & Carroll, 1984; Friedman, Schneiderman, West, & Corson, 1986; Kulka et al., 1988, 1990), there remains a lack of comprehensive, empirically derived scales addressing the war-related experiences distinctive to women. Thus, there is limited information on the breadth of stressor exposure in the war zone and any potential implications for women. The purpose of this article is to present the development and preliminary analyses of a self-report scale designed to measure wartime stressors in both veteran and civilian American women who served in various capacities during the Vietnam War. Civilian women were specifically included to provide initial empirical data on the stressors encountered by women who served in the war zone outside of the traditional military context. The scale was developed with two goals in mind: (a) to provide additional quantification of objective components of war stress based on the experiences of female personnel and (b) to delineate the experiences of this rarely studied group. Findings on the nature of war-zone stress would have implications for the future measurement of this phenomenon in both female and military populations in general.

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Method

Subjects

The overall sample included 202 women: 147 Vietnam theater veterans, 32 era veterans, and 23 theater civilians. *Theater veterans* included those who served in the country of Vietnam or surrounding countries, waters, or air space. *Era veterans* were women who served in the Armed Forces between 1964 and 1975 outside of the Vietnam theater (e.g., in Japan, Hawaii, or the continental United States). *Theater civilians* were defined as women who were not affiliated with the Armed Forces but worked in the Vietnam theater for service organizations (e.g., the American Red Cross, Catholic Charities) in a variety of occupations (e.g., clerical, administrative, medical, and technical positions). The sample was divided into three groups for purposes of scale construct validity and to better illustrate the realm of experiences of women who served during this era. Subjects ranged in age from 38 to 78 years, with a mean age of 49.7 ($SD = 7.3$). More than 85% of the female veterans were in nursing or medically related occupational specialties, consistent with the military occupational specialties of women from that era (Kulka et al., 1988). One quarter of the civilian subjects served in comparable (i.e., health-related) roles; approximately three quarters of civilian participants held clerical/administrative duty assignments. Demographic data for the three groups are presented in Table 1. There were no significant differences between the three groups for age, race, marital status, or educational level at the time of participation.

Materials

Women's Wartime Stressor Scale. Because women's wartime experiences during this era were diverse, it was important to obtain items measuring exposure from a range of sources. Consequently, definition of the exposure construct of the Women's Wartime Stressor Scale (WWSS; Wolfe, Furey, & Sandecki, 1989) was based on an initial 35-item pool derived from three sources: previously reported veterans' interview items (Kulka et al., 1988; Schnaier, 1986); existing anecdotal and descriptive literature on women and war (McVicker, 1985; Van Devanter, 1983); and clinical and autobiographical material provided by a consultant group of female Vietnam veterans.

On the basis of pilot data, eight items were deleted because of their redundancy or limited response variability. Three items were taken directly from the NVVRS, and two were from Schnaier (1986); the remainder represent combinations and revisions of preexisting questions or are novel items. The resulting scale has a Likert-type format consisting of 27 statements reflecting exposure to specific stressors. Items are accompanied by rating scales ranging from 0 (*no exposure*) to 4 (*maximum exposure*); possible total scores range from 0 to 108. To retain consistency with exposure scales developed for male veterans, WWSS items were constructed to depict actual events or experiences rather than feelings or attributions about these events.

Mississippi Scale for PTSD (revised version for women). This measure is a variation of the 35-item self-report scale used to detect PTSD symptomatology in male veterans (Keane, Caddell, & Taylor, 1988). The revision incorporated minor semantic changes in three questions that previous pilot data indicated were inappropriately phrased for use with female veterans.

Minnesota Multiphasic Personality Inventory (MMPI) PTSD subscale. This 49-item scale of the MMPI contributes to the identification of PTSD (Keane, Malloy, & Fairbank, 1984). Possible scores range from 0 to 49. In the original validation study using male combat veterans (Keane et al., 1984), a cutoff score of 30 yielded acceptable discrimination between male veterans with and without the PTSD diagnosis.

Table 1
Demographic Characteristics

	Theater		Era		Civilian	
Categorical variable	*n*	%	*n*	%	*n*	%
Race						
White	140	95.2	29	90.6	23	100.0
Black	1	.7	0	0.0	0	0.0
Hispanic	4	2.8	2	6.3	0	0.0
Native American	1	.7	1	3.1	0	0.0
Missing data	1	.7	0	0.0	0	0.0
Marital status						
Married	69	46.9	11	34.4	12	52.2
Single	54	36.7	9	28.1	6	26.1
Separated/divorced	22	15.0	12	27.5	5	21.7
Widowed	2	1.4	0	0.0	0	0.0
Current education level						
High school graduate/GED	3	2.0	3	9.7	1	4.3
Some college/professional school	26	17.7	12	38.7	1	4.3
College/professional school graduate	37	25.2	7	22.6	5	21.7
Some graduate work	26	17.7	1	3.2	4	17.4
Graduate degree	53	36.1	8	25.8	11	47.8
Missing data	2	1.4	0	0.0	1	4.3
Branch or organization						
Army	121	82.3	17	53.1	0	0.0
Air Force	8	5.4	8	25.0	0	0.0
Navy	16	10.9	6	18.8	0	0.0
Marines	1	.7	1	3.1	0	0.0
Non-military service organization	0	0.0	0	0.0	23	100.0
Missing data	1	.7	0	0.0	0	0.0

Symptom Checklist–90–Revised (SCL-90-R). This 90-item self-report measure (Derogatis, 1977) instructs subjects to rate a series of broad-based psychological symptoms for the preceding week. Traditional symptom ratings of 0 (*no distress*) to 4 (*very distressed*) were used. A General Severity Index is calculated by summing all 90 responses.

Procedure

Participants were drawn from lists compiled by Jessica Wolfe for use in projects at the Women Veterans Program of the National Center for PTSD, Behavioral Science Division. This list contained names of both civilian and veteran women who had served during the era and who had been involved over the years in community activities related to the war. Because these women are often difficult to locate, many names were also collected through the assistance of other veterans and theater civilians. No women in this study were seeking PTSD services from the Women Veterans Program at the time of the survey. A tabulation of rates of prior mental health service use revealed no differences among the three groups. Women were contacted by mail in the summer and fall of 1990 and asked to participate in a study to develop empirically based measures for the assessment of war-related PTSD in women. All participants completed the WWSS, a demographic questionnaire, and several psychometric tests to assess PTSD symptomatology (the revised version of the Mississippi Scale for PTSD, the MMPI PTSD subscale, and the SCL-90-R). Overall return rate was 51%.

All women volunteered to participate in this project. There was no reimbursement, but each participant received a follow-up letter thanking them for their assistance and a summary of the survey's results.

A random subsample of 100 women was recontacted in the fall of 1991 and asked to complete the WWSS a second time. Response rate was 62% within a designated 3-week interval. Data from three additional women were excluded from analyses because they responded after the cutoff date.

Statistical Analyses

Cronbach alpha and item–total correlations were used to assess the internal consistency of the WWSS; the scale's test–retest reliability was calculated using a Pearson product–moment correlation. A principal-components analysis was conducted to investigate the scale's factor structure. Univariate and multivariate analyses of variance were carried out to assess, respectively, whether there were differences in WWSS total and factor scores among the three groups.

Results

Internal Consistency

Coefficient alpha was calculated, yielding a value of .89. As a second measure of internal consistency, item–remainder total score correlations were computed, yielding an average correlation of .47 with a range of .30–.64.[1]

Test–Retest Reliability

Using a Pearson product–moment correlation, test–retest reliability with a 12 to 18 month interval was calculated at .91 ($p < .001$). There were no significant between-group differences in the test–retest correlations.

Descriptive Analyses

Mean WWSS total scores were 29.7 ($SD = 15.0$) for theater veterans; 15.9 ($SD = 11.4$) for era veterans; and 20.0 ($SD = 11.1$) for theater civilians. A one-way analysis of variance (ANOVA) indicated that these WWSS total scores were significantly different, $F(2, 199) = 15.25$, $p < .0001$. As predicted, the theater veterans had significantly higher exposure scores overall than did both theater civilians, $t(168) = 2.96$, $p < .01$, and era veterans, $t(177) = 4.91$, $p < .001$. There were no other significant differences.

Factor Analysis

A principal-components analysis using varimax rotation of eigenvalues greater than 1.0 generated eight factors. For an item to define a factor, a loading of .50 or greater was required. Examination of the scree-plot of eigenvalues indicated the prominence of the first four factors, which together accounted for 52.8% of the common variance (see Table 2). Factor 1 (9 items) addressed the quality of care provided or observed. Factor 2 (7 items) tapped significant interpersonal difficulties and discriminatory experiences as a woman and/or minority. The five items composing Factor 3 dealt with exposure to severe physical and environmental stressors, including threat to life. Factor 4 (4 items) represented catastrophic exposure to end-of-life events, that is, situations specifically involving the dying and dead. For each of the four factors, coefficient alpha was computed, yielding the following coefficients, respectively: .84, .83, .77, and .80.

Factor scores were then computed for each dimension using Gorsuch's (1974) approximation procedure, which assigns a weight of 1 to salient items and a weight of 0 to nonsalient items. Raw scores for each item are then multiplied by their respective weights and summed.[2]

To determine whether the three groups differed on the four factors, a series of one-way analyses of variance (ANOVAs) were conducted. Significant differences were found between the three groups for Factor 1, $F(2, 199) = 14.42$, $p < .0001$; Factor 3, $F(2, 199) = 40.73$, $p < .0001$; and Factor 4, $F(2, 199) = 34.94$, $p < .0001$. For Factor 1, Scheffé's post hoc tests indicated that theater veterans had higher exposure scores ($M = 6.0$, $SD = 5.7$) than did both theater civilians ($M = 1.8$, $SD = 2.2$) and era veterans ($M = 1.7$, $SD = 2.1$; $p < .05$). Similarly, theater veterans had higher scores for Factor 4 ($M = 7.4$, $SD = 3.9$) than did civilians ($M = 2.8$, $SD = 2.9$) or era veterans ($M = 2.3$, $SD = 3.4$; $p < .05$). For Factor 3, Scheffé's post hoc tests indicated that both theater veterans ($M = 8.5$, $SD = 4.0$) and civilians ($M = 7.0$,

[1] Individual item–total score correlations for the 27 items of the WWSS were .53, 36, .49, .53, .45, .34, .53, .43, .44, .51, .63, .64, .59, .45, .61, .44, .50, .46, .30, .49, .32, 32, .46, .41, .54, .38, and .32, consecutively.

[2] Although two items did not load on the primary four factors, input from a pilot group of female Vietnam veterans and theater civilians indicated that these items reflected salient components of women's wartime exposure and should be included in a comprehensive exposure scale.

SD = 3.9) scored higher than did era veterans (M = 1.7, SD = 2.7; $p < .05$).

Correlational Data

Significant Pearson product–moment correlations were found between the WWSS and the Mississippi Scale for PTSD ($r = .43$, $p < .001$); the MMPI PTSD subscale ($r = .35$, $p < .001$); and the SCL-90-R General Severity Index ($r = .39$, $p < .001$). With respect to demographics, neither age nor educational level correlated with scores on the WWES.

Discussion

Preliminary analyses of the WWSS show that it has sound psychometric properties and can be used with different subsets of women who served during the Vietnam era. Although a number of studies of men's wartime exposure have demonstrated the prominence of a single combat exposure factor (e.g., Keane et al., 1989; for reviews, see Watson et al., 1989; Wolfe & Keane, 1993), data from this study suggest that wartime exposure in these women is likely to have multiple components: Vocational role, physical context, and social milieu all emerged as significant components of wartime participation.

Results in this study demonstrated variations in both stressor level and type of exposure among subsets of women. To some degree, these differences reflect the range of women's roles in the war zone during this era (McVicker, 1985; Paul, 1985). For example, stressors related to quality of care and extensive exposure to the dead and dying were, in all likelihood, associated with the medical and other caregiving positions typically held by many female Vietnam veterans. On the other hand, although female theater veterans reported the highest exposure to life-threatening physical conditions, female theater civilians were also exposed to considerable risk. Thus, female war-zone personnel potentially encounter a diverse array of stressors, depending in part on their vocational role, actual assignment, and geographical placement. The use of scales such as the WWES, which evaluate a broad range of wartime experiences, is likely to enhance the validity of assessment in these individuals and potentially in other military personnel who serve outside of traditional combat contexts (e.g., medical roles).

In contrast to other WWSS factors, the scale dimension dealing with sexual harassment and victimization did not differentiate among groups of women in this study. This finding is consistent with other reports suggesting that sexual harassment, abuse, and assault are prevalent among women irrespective of background or occupational status (Kilpatrick & Resnick, 1993; Koss, 1990; Wolfe, 1990). However, because data in the current study focused only on women and on the presence, rather than prevalence, of gender-specific stressors, the distinctive scope and magnitude of these types of events and their relationship to more traditional sources of wartime PTSD merit further investigation.

Preliminary analyses of psychometric data confirmed the link between total wartime exposure and self-reported symptoms of PTSD and general psychological distress. This moderate association is comparable to that found for combat exposure measures used with non-treatment-seeking male samples (Keane et al., 1988, 1989; Kulka et al., 1988, 1990) and reflects the variability in outcome following exposure to traumatic events (Breslau & Davis, 1992; Breslau, Davis, Andreski, & Peterson, 1991; Norris, 1992; Resnick, Kilpatrick, Best, & Kramer, 1992). Although there is a risk that negative emotionality (associated with symptomatology) enhances the correlation between outcome and self-reported exposure, the present findings are strengthened to some degree by the use of a non-treatment-seeking sample. Still, additional information is needed to examine the relationship between distinctive stressor experiences (as elucidated in this study) and the development of PTSD in these women.

One concern in this study is the absence of data on female subjects who did not return the survey, specifically their comparability to the population of women who served in Vietnam. Consequently, the present results must be conservatively interpreted with respect to certain variables of interest (e.g., the scale's factor solutions). More detailed examination of the WWSS' psychometric properties using larger samples and improved response rates will further substantiate the utility of this instrument.

Results suggest that components of war-zone stress may be broader than have been traditionally defined; as such, examination of exposure in women offers a unique opportunity to review the objective measurement of wartime stress. This study does not address, however, the degree to which women's war stressor experiences (or perceptions of them) may be gender specific, that is, whether deployed men would have responded similarly to various items. Similarly, little is known about the use of this scale with women from other eras (e.g., the Gulf War. Generalizability of these results to other populations of female veterans (e.g., Operation Desert Storm) will be especially important as military roles of women continue to evolve and diversify (i.e., more frequent assignment to combat and combat support positions). In a recent study of the exposure of American veterans from that conflict, Wolfe, Brown, and Kelley (in press), using different measures, found that deployed women's self-reported exposure reflected a number of dimensions like those found in the WWSS (e.g., the presence of significant environmental stressors, discriminatory experiences, and extensive contact with death and dying). Unlike respondents in the present study, however, female Gulf War veterans described fewer stressors relating to the quality of care or professional performance.

These disparities are likely to reflect the vastly changing roles of women in the U. S. Armed Forces today. Interestingly, despite marked overall similarity in the war-zone experiences of male and female Gulf veterans (who were interspersed among the same units), women reported a different hierarchy of stressors than did men: For women, the top two war-zone stressors were SCUD attacks and the death of a friend or unit member, whereas men's primary stressors were SCUD attacks and SCUD alerts. Thus, both era of service and gender appear to be factors that are associated with the perceived primacy of wartime events. Further use of scales such as the WWSS with both female and male veterans is needed to examine issues of

Table 2
Factor Loadings of Principal-Components Analysis for the Women's Wartime Stressor Scale: Sample Scale Items

No.	Item	Factor loading
	Factor 1. Quality of Care Issues	
11.	How often did you observe patients die because of lack of equipment or personnel?	.82
12.	What percentage of the time did you make critical or life-threatening errors in your work because of excessive fatigue or work load?	.69
13.	How many times did you have to decide who would receive life-saving medical care?	.76
15.	How often were you responsible for making the decision to allow a patient to die?	.81
	Factor 2. Discriminatory Experiences	
20.	During your war-time participation, what percentage of the time did you encounter verbal or physical sexual harassment?	.80
21.	During your war-time participation, how many times did you have a sexual experience that was unwanted *and* involved the use or threat of force?	.74
24.	What percentage of the time were you extremely isolated by virtue of being a woman?	.73
26.	What percentage of the time did you encounter professional or social discrimination because you are a woman?	.76
	Factor 3. Environmental Stressors	
9.	Relative to your pre-war occupation, how often did you have a day off or time for R & R?	.62
10.	Were you ever forced to perform your job under (enemy) fire?	.79
17.	How much of the time did you function in an environment that was unusually uncomfortable (i.e., as compared with the average level of discomfort)?	.68
18.	How often were you in actual danger of being injured or killed?	.82
	Factor 4. Exposure to Catastrophic Death and Dying	
3.	How often did you view a continual stream of casualties?	.65
4.	How often did you view casualties who were severely mutilated?	.63
6.	How much of the time were you involved in postmortem preparation and/or evacuation of bodies?	.60
7.	Did you ever sit with anyone dying from war-related causes?	.59

test generalizability and to help additionally refine parameters of wartime exposure across a variety of populations.

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